# UNITED STATES PATENT AND TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/823,272 | 04/02/2001 | Hyun-doo Shin | Q59549 | 7285 |

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|---|---|
| 7590 09/08/2005 | EXAMINER |
| SUGHRUE, MION, ZINN, | HUNG, YUBIN |
| MACPEAK & SEAS, PLLC | |

| | ART UNIT | PAPER NUMBER |
|---|---|---|
| 2100 PENNSYLVANIA AVENUE, N.W. | | |
| WASHINGTON, DC 20037-3213 | 2625 | |

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 09/823,272 | SHIN ET AL. |
| | Examiner | Art Unit | |
| | Yubin Hung | 2625 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on <u>*15 April 2005*</u>.

2a) ☐ This action is **FINAL**.    2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) *1,3-8 and 10-13* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1,3-8 and 10-13* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *18 January 2005* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☒ All   b) ☐ Some * c) ☐ None of:

       1. ☒ Certified copies of the priority documents have been received.

       2. ☐ Certified copies of the priority documents have been received in Application No. _____.

       3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. <u>*07/2?/05*</u>.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

## Response to Amendment

1.      Applicant's request (04/15/2005) for reconsideration of the finality of the rejection

of the last Office action is persuasive and, therefore, the finality of that action is

withdrawn.

2.      Claims 2 and 9 have been canceled; claims 1, 3-8 and 10-12 are still pending.

3.      Examiner acknowledges receipt of the replacement drawing for Fig.1 (filed

01/18/2005).  As a result, the objection to the drawings has been withdrawn.

## DETAILED ACTION

### Claim Rejections - 35 USC § 103

4.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in
section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
such that the subject matter as a whole would have been obvious at the time the invention was made to a
person having ordinary skill in the art to which said subject matter pertains.  Patentability shall not be negatived
by the manner in which the invention was made.

5.      Claims 1, 3, 7, 12, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Wan et al. ("A New Approach to Image Retrieval with Hierarchical Color

Clustering," *IEEE Trans. on Circuits and Systems for Video Technology*, Vol. 8, No. 5,

Sep. 1998, pp. 628-643), in view of Kothuri et al. (US 6,381,605).


6.      Regarding claim 1, and similarly claim 7, Wan discloses

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(pa-1) partitioning the feature vector data space into a plurality of
       cells having a uniform size
       [P. 631, Section B(1). Note that the feature vector space is
       the color space (colors of the pixels being the feature
       vectors). Note further that the last three lines of Section
       B(1) suggests further partitioning of the cells]
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Wan does not expressly disclose the following limitations; however, Kothuri et al.

teaches/suggests them as indicated below:

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(a)     determining whether one or more cells from said plurality of
        cells, on each of which one or more of said plurality of feature
        vectors are correspondingly concentrated, exist
        [Fig. 5, numerals 506, 518; Col. 14, line 55 - Col. 15, line 43.
        Note that Node Capacity is a predetermined threshold]
(b)     hierarchically indexing the feature vector data space when it is
        determined that said one or more cells, on each of which said one
        or more of said plurality of feature vectors are correspondingly
        concentrated, exist in the step (a), wherein, one or more feature
        vectors are concentrated in a cell when the cell contains more
        feature vectors than a predetermined threshold.
        [Fig. 5, the loop of refs. 506-522; Col. 3, lines 27-37; Col. 14,
        lines 55-56. Note that the recursive portioning of the feature
        space (see Fig. 5) inherently defines a tree structure that
        serves as the hierarchical indexing of the partitioned feature
        space with each leaf node corresponds to a cell]
```


Wan and Kothuri are combinable because they have aspects that are from the

same field of endeavor of image indexing.


At the time of the invention, it would have been obvious to one of ordinary skill in

the art to modify Wan with the teachings Kothuri by hierarchically indexing the feature

space if some cells have more feature vectors than a predetermined threshold. The

motivation would have been to ensure that each cell contains no more feature vectors

than a threshold determined by a parameter of a suitable physical storage device, as

Kothuri indicates in column 3, lines 35-38.

Therefore, it would have been obvious to combine Kothuri with Wan to obtain the

invention as specified in claim 1.

7.      Regarding claim 3, the combined invention of Wan and Kothuri further discloses

- Constructing a histogram illustrating a number of said plurality of
  feature vectors in each of a plurality of cells, including said one or
  more cells
  [Wan: P. 629, Sect. II.A.  Note that the color of a pixel is a feature
  vector and each cell of a partition of the color (i.e., feature) space
  corresponds to a histogram bin]
- Analyzing a distribution of said plurality of feature vectors using the
  histogram and determining whether said one or more cells, on each of
  which said one or more of said plurality of feature vectors are
  correspondingly concentrated, exist.
  [Kothuri: Fig. 5, numerals 506, 518.  Note that each cell, or node,
  corresponds to a histogram bin]

8.      Regarding claim 12, and similarly claim 13, Kothuri et al. further discloses using

nearest neighbor query to conduct search [Col. 19, lines 30-39].  Therefore, claim 12 is

rejected per claim 1 and the additional disclosure recited above.

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9.      Claims 4-6, 8, 10 and 11 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Wan et al. ("A New Approach to Image Retrieval with Hierarchical

Color Clustering," *IEEE Trans. on Circuits and Systems for Video Technology*, Vol. 8,

No. 5, Sep. 1998, pp. 628-643) and Kothuri et al. (US 6,381,605) as applied to claims 1,

3, 7, 12, 13 above, and further in view of Weber et al. ("A Quantitative Analysis and

Performance Study for Similarity-Search Methods in High-Dimensional Spaces,"

*Proceedings of the 24th International Conference on Very Large Data Base*, New York,

August 1998, pp. 194-205).


10.     Regarding claim 4, the combined invention of Wan and Kothuri et al. discloses

everything except for the following limitations.  However, Weber et al. teaches/suggests

them as indicated below:

- The indexing method of claim 1, wherein the step (b) comprises the step
  of indexing the feature vector data space using a vector approximation
  file
  [Section 4.1, lines 1-13]


The combined invention of Wan and Kothuri is combinable with Weber because

they have aspects that are from the same field of invention of image indexing.


At the time of the invention, it would have been obvious to one of ordinary skill in

the art at the time the invention was made to modify the combined invention of Wan and

Kothuri by using VA-file for indexing as taught by Weber in order to overcome the

indexing difficulty resulted from increased dimensionality of the feature space.


Therefore, it would have been obvious to combine Weber with Wan and Kothuri

to obtain the invention as specified in claim 4.

11.    Claims 5 and 6 are similarly analyzed and rejected as per claims 1 and 4 since

Kothuri et al. discloses recursive partition of cells in Figure 5 and Weber et al. teaches

approximating the data points (i.e., feature vectors) that fall into each cell with the

corresponding VA-file in lines 5-8 of Section 4.1.

12.    Claims 8 and 10 are medium claims of claims 4 and 6, respectively, and are

therefore similarly analyzed and rejected.

13.    Claim 11 is a medium claim for the combined method of the methods recited in

claims 3-6, respectively, and is therefore similarly analyzed and rejected.

### Contact Information

14.    Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Yubin Hung whose telephone number is (571) 272-

7451.  The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Bhavesh Mehta can be reached on (571) 272-7453.  The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).


Yubin Hung
Patent Examiner
August 30, 2005

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